By deterioration is meant, first, a deviation from the professed standard.

The professed standard is regarded as that condition represented by the preparation when it is freshly prepared. Such deviation from the professed standard as above referred to may be determined by:

(*a*) Microscopical examination. If a medicinal liquid shall be found by microscopical examination to have become so decomposed that bacterial germs and germs of decomposition are found therein, it shall be considered deteriorated.

(*b*) Chemical examination. If by chemical examination any of the professed ingredients, such as pepsin, pancreatin, or any of the other ferments, be found absolutely inactive, or if a cocoa preparation give no reaction, showing the absence of the alkaloid, etc., such preparation shall be considered deteriorated.

(*c*) Macroscopical, etc. If a preparation differ in appearance materially from that freshly prepared. If, for example, there have developed a precipitate evidently through aging of a liquid, or if it should from odor, taste or other physical tests show evidence of impairment or decomposition, any of these conditions shall be taken as ground for deeming the article deteriorated. Any deteriorated drug products offered for sale shall be liable to the application of regulation 30 of the food and drugs law.

THE LACTOSE-BILE TEST FOR THE COLON BACILLUS.

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THE discovery of *Bacillus coli* in 1885 by Escherich, followed by the proof that this micro-organism is a normal inhabitant of the intestines of mammals, especially of man, has led bacterioscopists to pay special attention to its isolation. Since *B. coli* is always found in sewage and polluted water, and since it is comparatively easy of detection, this germ is taken as a most valuable index of the sanitary condition of potable waters.

In presumptive tests, the common practice has been to employ a dextrose broth made by adding two per cent. of dextrose to the common French bouillon in the ordinary fermentative tube. The bacterium attacks the dextrose, liberating carbon dioxid and hydrogen, which is taken as indicative of the presence of *B. coli*, or at any rate a sugar-loving, gas-forming bacterium.

Unfortunately this test is not always reliable, especially when negative results are obtained owing to the interference of other

bacteria. This is especially so in badly polluted waters, in which case the gas-forming bacteria may be much overgrown and crowded out by non-gas-producers. Hence, analysts have sought diligently for a medium which would restrain the non-gas-producing bacteria, and at the same time not interfere with the normal action of the gas producers.

In the Supplement to the Journal of Infectious Diseases, May 3, 1907, Daniel D. Jackson presents an article on the "Use of a Lactose-bile Medium" which at that time had proved to be reliable in presumptive tests for *B coli.*

The lactose-bile medium is prepared by drawing liquid ox bile directly from the animal and sterilizing it. The bile is then filtered and to it is added one per cent. of lactose previously dissolved in a small amount of water, after which it is drawn off into fermentation tubes and sterilized in an autoclave for thirty minutes at fifteen pounds pressure. The ordinary plain fermentation tubes may be used, but Jackson recommends tubes 140 mm. long and 15 mm. in diameter, having an elongated bulb 38 mm. in its shortest diameter. This admits of the use of a considerable quantity of the water to be tested without too great dilution of the medium.

Mr. Jackson reports that at Mount Prospect laboratory, Brooklyn, N. Y., about 5000 samples of water of various degrees of purity and from hundreds of different sources have been tested by this medium and the results agreed with the judgments formed by the complete analyses of the samples as well as by careful sanitary inspection of the sources of supply. In many instances contamination has been found to exist which would not otherwise have been detected.

The extreme efficiency of this ox-bile medium in tests for *B. coli* is due to the selective inhibiting power of the cholic acid radical of the bile by which bacteria other than the colon bacillus are restrained or killed. Nearly all the bile salt present is in the form of a glycocholate. Experiments show that no meat extract is needed, as the bile contains albuminous matter enough to feed the bacteria.

It has been the practice at the Ottawa laboratory to procure from the local butcher ox galls in sufficient number to yield a quart of bile at a given time. The bile is drawn out, autoclaved and kept in plugged flasks in a liquid form until needed. It may be evaporated to dryness and kept in the form of powder. In this case, however, it must be perfectly dry or in a short time it will become too acid for use. A gram of lactose, 11 grams of solid bile

salts, and 100 cc. of water give a combination which is equivalent in results to the medium made from fresh liquid ox bile.

Presumptive tests with this medium are not only more reliable than those employing other media, but are easily made, requiring the minimum skill in application. The lactose-bile medium is especially valuable in testing wells, cisterns and filter plants.